

THE HOLOTYPE OF *HETEROCARPUS ALEXANDRI*  
A. MILNE-EDWARDS  
(CRUSTACEA: DECAPODA: PANDALIDAE)

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*Abstract.*—The ovigerous female holotype of *Heterocarpus alexandri* from off Havana, Cuba, is described and reillustrated. A male of presumably the same species is recorded from the Bahamas, and probably two related species are recorded and diagnosed from the Pacific region: *H. nesisi* Burukovsky from Baja California and an undescribed species previously recorded as *H. alexandri* from Hawaii. The systematic status of *H. alexandri* is discussed but not consummated.

This paper was prompted by the discovery in the collection of the Museum of Comparative Zoology, Harvard University, of the holotype of *Heterocarpus alexandri*, which had been rather inadequately described and was feared lost. This opportunity was made especially significant by the revelation that A. Milne-Edwards' (1883) original illustration (there was no written description) was erroneous in several important characters, thereby precluding assurance of the identification of the species from other material. Although I have offered comparisons of *H. alexandri* with specimens of related species from the Pacific and have discussed the possible systematic status of those species, my objective in this contribution has been to record the typical features of *H. alexandri* for future reference, not to define its hierarchical position in the family.

Family Pandalidae

Genus *Heterocarpus* A. Milne-Edwards

*Heterocarpus alexandri* A. Milne-Edwards,  
1883

Fig. 1

*Heterocarpus Alexandri* A. Milne-Edwards,  
1883 [unnumbered plate] [type locality:  
*Blake* dredging no. 2; north of Havana;

23°14'00"N, 82°25'00"W; 805 fms (1472 m)].—De Man, 1920:108, 153, 154.

*Heterocarpus alexandri*.—Faxon, 1896:  
161.—Chace, 1985:19, 20, fig. 13*b*.—Bu-  
rukovsky, 1986:64, 67, 69.

*Description of holotype.*—Ovigerous female with postorbital carapace length of 12.8 mm. Rostrum (Fig. 1*a*) incomplete, existent portion nearly three-fourths as long as postorbital carapace, overreaching antennal scale, with sharp lateral carina arising from orbital margin, armed dorsally with eight strong teeth, four on carapace posterior to orbital margin, posteriormost arising slightly anterior to midlength of carapace, bearing denticle on posterior slope, armed ventrally with four teeth. Carapace with middorsal carina extending over anterior two-thirds of length, posterior one-third smoothly rounded; antennal spine flaring sinuously laterad from origin below orbit, slightly smaller than anteriorly directed branchiostegal spine, latter buttressed by submarginal carina extending to near midlength of carapace; low, broad elevation, accentuated by rather deep dorsal and ventral depressions, extending posteriorly from orbital region and indistinctly joining somewhat more distinct suprbranchial ridge reaching nearly to posterior margin of carapace.

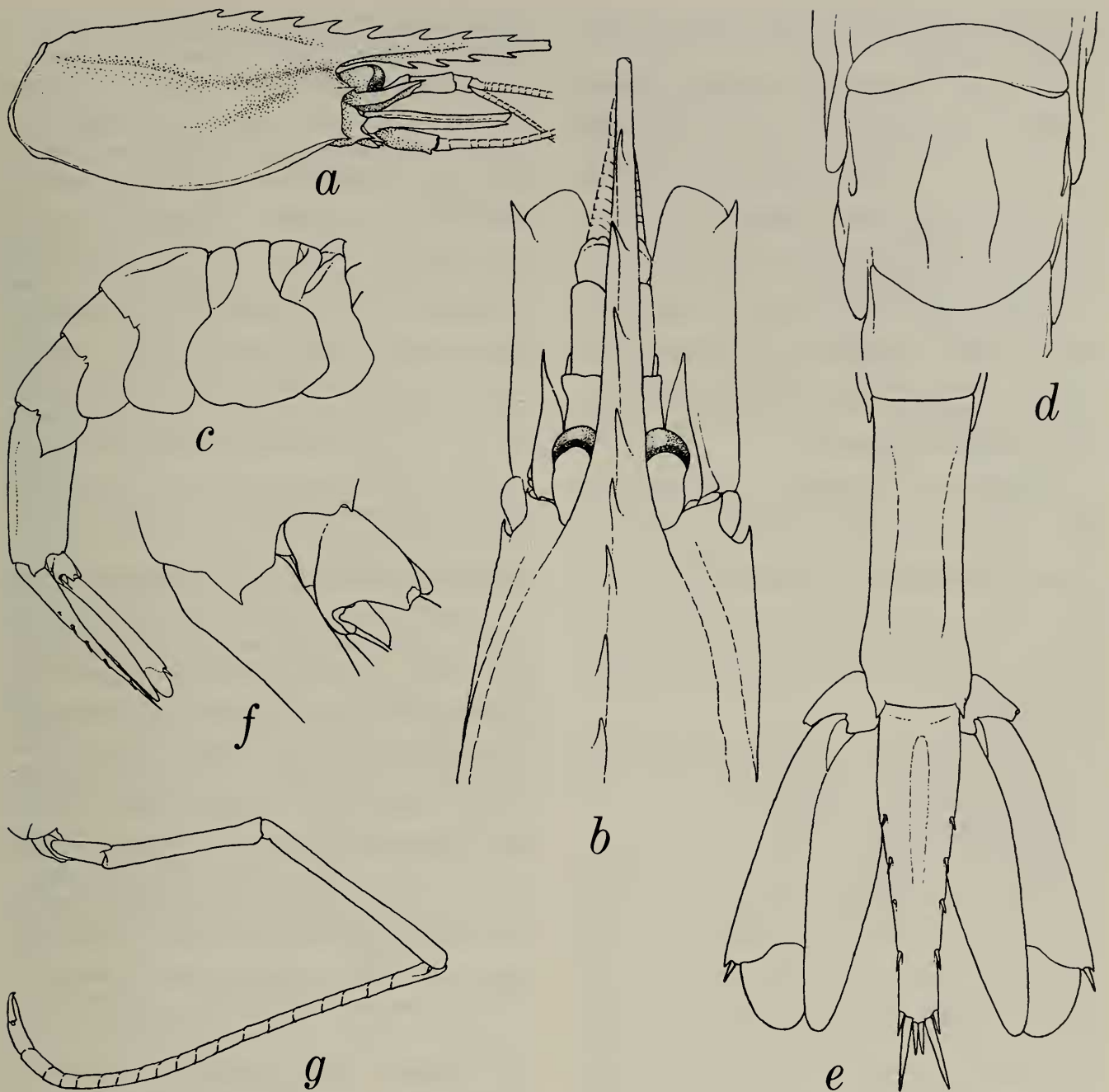


Fig. 1. *Heterocarpus alexandri*, ovigerous female holotype: *a*, Carapace and anterior appendages, lateral aspect; *b*, Same, dorsal aspect; *c*, Abdomen, lateral aspect; *d*, third abdominal somite, dorsal aspect; *e*, Sixth abdominal somite, telson, and uropods, dorsal aspect; *f*, Juncture of sixth abdominal somite and telson, lateral aspect; *g*, Right second pereopod. (Magnifications: *a*, *c*,  $\times 3$ ; *b*, *d*, *e*, *g*,  $\times 6$ ; *f*,  $\times 12$ .)

Abdomen (Fig. 1*c*) with tergum of first somite rather severely distorted, second somite with distinct, anteriorly convex, posteriorly setose transverse groove crossing tergum posterior to midlength, third somite with sharply defined middorsal boss on tergum (Fig. 1*d*); sixth somite fully one and three-fourths times as long as fifth somite, slightly more than twice as long as high,

dorsal surface shallowly convex and bluntly distinct from lateral surface (Fig. 1*e*), armed posteroventrally with small but discrete tooth (Fig. 1*f*); pleura of four anterior somites with irregularly convex margins, pleuron of fifth somite with sharp posteroventral tooth. Telson (Fig. 1*e*) deeply sulcate mid-dorsally on anterior half of length, armed with five pairs of dorsolateral spines, in-

cluding pair lateral to long, intermediate posterior spines.

Eye with subspherical cornea slightly broader than stalk, without ocellus (Fig. 1*b*). Antennule with stylocerite narrowly tapering to sharp point near level of second third of second antennular segment. Antennal scale with lateral margin nearly straight, terminating in strong distolateral tooth not reaching level of distal oblique margin of blade. Third maxilliped overreaching antennal scale by length of terminal segment, exopod reaching to about midlength of antepenultimate segment.

Pereopods with epipods on four anterior pairs. First pereopods missing or incomplete. Right second pereopod (Fig. 1*g*) overreaching antennal scale by length of chela and about one-third of carpus, carpus composed of 18 articles; left second pereopod missing. All three pairs of posterior pereopods missing.

Uropod (Fig. 1*e*) with branches subequal in length, slightly overreaching telson, not including posterior spines.

Eggs measuring about  $0.4 \times 0.6$  mm.

*Remarks.*—The unique holotype differs from *A. Milne-Edwards*' original illustration in having the margin of the pleuron of the fourth abdominal somite rounded instead of posteroventrally acute, the telson armed with five rather than four pairs of dorsolateral spines, the blade of the antennal scale oblique rather than transversely truncate, and the carpus of the right second pereopod composed of 18 rather than 25 articles.

The specimen assigned to *H. alexandri* by Faxon (1896:161) from *Blake* dredge no. 196; off Martinique; 1030 fms (1884 m) apparently has been temporarily misplaced in the MCZ collections, but there is a male of that species in the Smithsonian collections, taken by the *Albatross* at station 2629; mouth of Exuma Sound, Bahamas;  $23^{\circ}48'40''N$ ,  $75^{\circ}10'40''W$ ; 1169 fms (2138 m); 8 Mar 1886. That specimen has a postorbital carapace length of 11.0 mm; the an-

terior part of the rostrum is missing beyond the seventh dorsal and the posterior ventral teeth. It differs otherwise from the holotype in having the submarginal carina that buttresses the branchiostegal spine less sharp; the tergum of the first abdominal somite traversed by a distinct, anteriorly convex groove similar to the one on the second somite; the margins of the dorsal boss on the third somite curving laterad more strongly at the anterior end; the sixth somite nearly twice as long as the fifth and about two and one-half times as long as high; the telson armed with five pairs of dorsolateral spines on the left side but only four on the right, including the pair lateral to the intermediate posterior spines; the stylocerite not overreaching the acute lateral projection of the first antennular segment; the blade of the antennal scale slightly narrower beyond the base of the distolateral spine than in the holotype (but not quite as distinctly so as indicated in Chace (1985:fig. 13*b*)); the first pereopod overreaching the antennal scale by about one-half the length of the chela; and the appendix interna on the second pleopod overreaching the appendix masculina by at least one-fourth of its length. In virtually all other characters, the male agrees with the ovigerous female holotype.

The Hawaiian specimen recorded as *H. alexandri* by Rathbun (1906:918) from *Albatross* station 4181; near Kauai Island; 811–671 fms (1483–1227 m) is an ovigerous female with a postorbital carapace length of 9.7 mm. It almost certainly represents a distinct species. The rostrum reaches only about as far as the distal end of the antennular peduncle, does not reach the level of the distal end of the antennal scale, and has a rostral formula of  $4+6/4$ ; although the carapace is very like that of *H. alexandri*, the transverse grooves on the first and second abdominal somites are much less distinct, that on the second being virtually nonexistent, and there is no suggestion of a boss on the tergum of the third somite; the sixth somite is two and one-fourth times as long

as the fifth and fully two and one-half times as long as high; the telson is deeply sulcate anteriorly, but the posterior one-half is missing.

Another Smithsonian specimen, identified by Waldo L. Schmitt as *H. alexandri*, from "D. 5682," which almost certainly refers to an *Albatross* station by that number in San Lucas Bay, Baja California; 22° 48'20"N, 109°52'40"W; 491 fms (898 m); 24 Mar 1911, is a large female with a postorbital carapace length of 31.5 mm; the rostrum far overreaches the antennal scale and has a rostral formula of 4+7/7; the middorsal postrostral carina reaches posteriorly to about the posterior one-sixth of the postorbital carapace length, and the lateral postorbital ridge is very like the one in the holotype of *H. alexandri*, but the branchiostegal spine is situated closer to the antennal spine and is not supported by a long, carinate buttress; the two anterior abdominal somites lack transverse grooves; the third abdominal somite is produced posteriorly in the midline, but it is without a dorsal boss on the tergum, except for a vestige suggested by a short, mesially convex furrow on each side of the midline; the sixth abdominal somite is somewhat transversely convex dorsally, nearly two and one-fourth times as long as the fifth, and one and two-thirds times as long as high; the telson is rather deeply sulcate dorsally, especially anteriorly, armed with five pairs of dorsolateral spines, including the pair lateral to the intermediate posterior spines; the eyestalk widens distally to a nearly hemispherical cornea; the pereopods have well-developed epipods on the four anterior pairs; the first pair slightly overreaching the antennal scale; the right second pereopod reaches at least to the distal one-fourth of the antennal scale, the carpus is composed of five articles; the left second pereopod overreaches the antennal scale by the length of the chela and the distal carpal article, and the carpus composed of 15 articles; the third pereopod overreaching the antennal scale by the

lengths of the dactyl and propodus, the dactyl bearing four spines on the flexor margin proximal to the distal tooth; the uropod with the lateral branch reaching to the level of the posterior margin of the telson, not including the posterior spines.

It seems probable that the specimen from the southern tip of Baja California may be identifiable as *H. nesisi* Burukovsky, 1986, previously known only from the male holotype, with an apparent postorbital carapace length of about 27 mm, found about 1600 kms southwest of the *Albatross* station at 13°34'N, 120°33'W, on an apparent seamount in 800 m in an area where total depths are near 4300 m. Although the Hawaiian specimen agrees with the one from Baja California and disagrees with *H. alexandri* in the indistinct or nonexistent grooves on the first and second abdominal tergites and the absence of a dorsal boss on the third tergite, it differs so clearly from *H. nesisi* in its much smaller size, shorter rostrum, and much longer sixth abdominal somite as to suggest that it represents an undescribed species.

There is little doubt that Crosnier (1986a: 368) had ample reason to remove *H. laevis* A. Milne-Edwards, 1883, from the genus *Heterocarpus* and to transfer it and its Pacific analogue *Plesionika chacei* Crosnier, 1986 (renamed *P. fenneri* Crosnier, 1986b), to the genus *Plesionika* because of their similarity to *P. bifurca* Alcock & Anderson, 1894, and *P. spinidorsalis* (Rathbun, 1906). Similarly, the three species discussed above probably belong to the same genus as the four assigned to *Plesionika* by Crosnier (1986a), because they lack strong postorbital or postantennal carinae and have the carapace transversely convex rather than carinate in the dorsal midline of the posterior one-fourth or more of its length. I am not proposing that change here, however, because these seven species seem to form a rather homogeneous group quite different from *Plesionika uniproducta* Bate, 1888 (= *Acanthephyra ensis* A. Milne-Edwards, 1881), the type species of *Plesionika*. The

family Pandalidae displays considerable morphological diversity, but some of the genera are so obscurely differentiated as to engender the possibility that a group of species clustered around *Heterocarpus laevis* and *H. alexandri* might eventually constitute a valid separate genus. The danger of prematurely accepting potential generic characters in the family, however, is manifested by the occurrence of a well-defined boss on the tergum of the third abdominal somite in those two Atlantic species and the virtually complete absence of such a boss in the Pacific species that are obviously closely related to them: *Plesionika fenneri*, *Heterocarpus nesisii*, and the Hawaiian specimen assigned to *H. alexandri* by Rathbun (1906).

#### Acknowledgments

But for the serendipity provided by Ardis Johnston of the Museum of Comparative Zoology in response to my inquiry about the specimen identified by Faxon (1896:161) as *Heterocarpus alexandri*, the holotype of that species would have remained "lost" indefinitely. I am most grateful to her for that welcome information and for making the type specimen available to me. I also thank Alain Crosnier of the Muséum national d'Histoire naturelle in Paris and my Smithsonian colleague Brian Kensley for reading the manuscript.

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